



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

FRIDAY, JULY 16, 1858.

MEETING OF COUNCIL.

The following Institution has been taken into Union since the last announcement :—

Whitby, Institute of Popular Arts, Science, and Literature.

SPECIAL PRIZE.

The Prize of Twenty Pounds (placed at the disposal of the Council for this purpose by the Rev. F. French and J. MacGregor, Esq.,) and the Society's Silver Medal, offered for a Writing Case suited for the use of soldiers, sailors, emigrants, &c., will be awarded according to the following conditions :—

1. *Weight*.—None will be received weighing above five ounces when empty.
2. *Size*.—The size in length and breadth must not exceed that necessary to hold note paper.
3. *Ink*.—The case must not contain ink in a fluid state.
4. *Durability*.—It must be made of a substance not liable to be spoiled by wet, and which will protect the contents from injury.
5. *Cheapness*.—The retail price, with guaranteed supply, must not exceed 1s. 6d.

Competitors are desired to take notice that the Council reserve to themselves the right of withholding the prize should there be no article of sufficient merit brought under their notice.

The articles sent in for competition must be delivered at the Society's House, Adelphi, London, W.C., on or before the 1st of January, 1859.

PRODUCE OF WESTERN AUSTRALIA.

Samples of Olive Oil and of Raisins have been forwarded to the Society from the Chamber of Commerce, Freemantle, Western Australia, which are stated to be the produce of that colony. The Council have been favoured with the following reports as to their quality and commercial value from the gentlemen to whom they were referred for examination :—

May 27, 1858.

DEAR SIR,—The sample of raisins submitted to me for my opinion is in bad condition, much candied, and would not keep many weeks longer; its present value is not more than 35s. per cwt., duty paid (10s. being the duty). Apart from its present condition I consider it fine fruit; its flavour is peculiar; but, in my opinion, the public would soon get used to like it for cooking purposes. It would not, however, sell with, or instead of, what we term *Muscateles*, the fruit that is used for our table. It

is not good enough for that, its skin is too thick, and the flavour is not delicate enough for that purpose.

But to render it fit for cooking, the raisin should be differently cured. The Valencia raisin, which we now mainly use, is, before drying, dipped into a hot wash, which acts chemically on the skin, and literally cuts it, so that the fruit boils quickly out, and gives a richness to the pudding which cannot be obtained from merely sun-dried fruits. Thus, although many different kinds of raisins are imported into England, the Valencia produce has always, and often under the most adverse circumstances as to price and quality, maintained its preference. The wash used in Valencia consists of water which has been passed through a barrel filled with wood ashes, mixed with a very small quantity of lime; this is raised to boiling point, and the fruit rapidly dipped through it. Too strong a wash, or the fruit being at all left in it, will utterly destroy the grape; but a little practice will soon show this. The lime also must be used very sparingly, a quart being enough for a large barrel full of the wood ashes. Some sorts of wood, such as the fig, are objectionable.

And as to the probable price this Australian fruit, dressed in this way, and put into convenient packages, would bring, I should say that nothing above 45s. must be expected; from this, if you deduct duty, 10s.; landing charges, &c., 1s.; commission expenses, 1s.; freight, &c., 3s.; about 30s. would be left. It must be remembered that our great season of demand is from September to Christmas, and that all fruit arriving after that time is at a disadvantage. On the other hand, the blight has damaged the quality and reputation of Valencias, so that this Australian fruit, which appears quite free from taint, would, with many, have a preference. Its dark colour is a bad point,—probably this would be softened by the mode of dressing I recommend. I will only add that great care should be taken in packing and preparing the first quantity that may be sent to this market, so that the first impression may be good. For so long a voyage barrels would be better than boxes, but they should not be too large, certainly never beyond 3 cwt., and better if they did not much exceed 1 cwt.

Yours faithfully,
J. I. TRAVERS.

To the Secretary of the Society of Arts.

William-street, Blackfriars, May 28, 1858.

SIR,—We have carefully examined the sample of oil from Western Australia, and are of opinion that it is, as represented, a pure olive oil; specific gravity 917.3, and the reactions of chemical tests correspond thereto. It appears to us not to have been very well prepared, but we have no doubt that with improved means a better result would be obtained. We consider its present value to be about £48 per ton, delivered in London, and that it would be likely to meet a tolerably ready sale.

We are, sir, yours faithfully,
CHARLES PRICE & CO.

P. Le Neve Foster, Esq.

182, Piccadilly, June 3, 1858.

DEAR SIR,—In compliance with your request for our opinion of samples of olive oil and raisins, the produce of Western Australia, the results of comparison enable us to report very favourably on the quality of the former, which, we consider, for domestic uses fully equal to the importations from Leghorn, but bearing a closer resemblance to the oil from the South of France, which by many is even considered preferable. Such oil is now realising from 5s. 6d. to 6s. 6d. the gallon in this market, and reaches here in pipes of 108 gallons, also in hogsheads and jars; but the greatest care must be taken that whatever package is used must be perfectly free from any taste or smell likely to interfere with the delicate flavour of the oil.

Respecting the raisins, we much fear they would not be likely to prove a safe article for this market, which

is so well supplied from Spain; and we think the long voyage they would be subject to would greatly tend to deteriorate the quality, as all fruit is liable to fermentation by long stowage. The sample sent appears to us of various qualities, partaking of different characters, some evidently being of the Valencia, others of the Muscatel kind. Such fruit would not realise more than 28s. to 36s. in this country; but as a much more satisfactory clue as to results of novelties introduced in our markets, we recommend that small consignments should be sent in the first instance, the realisation of which through the hands of a respectable broker would furnish the merchant or grower with the actual value which they would realise in open market; the proceeds would show how far the article may be worth the exportation.

We are, dear sir, yours respectfully,
FORTNUM, MASON, & Co.
 P. Le Neve Foster, Esq., Secretary of the Society of Arts.

EXAMINATIONS, 1858.

The following are the Papers set in the various subjects at the Society's Final Examinations, held in May last:—

ARITHMETIC.

THREE HOURS ALLOWED.

N.B.—The questions in this paper are arranged, as far as possible, in the order of difficulty, and it is not expected that any Candidate should solve more than one-half of them. The last eight questions are specially intended to test the knowledge of such persons as are desirous of gaining the highest class of Certificate.

- Find the value of $581\frac{3}{4}$ yards of cloth at 5s. 9d. per yard.
- If 12 apples are worth 21 pears and 3 pears cost $\frac{1}{2}$ d., what is the price of 70 apples?
- If an army of 5,000 men could march 96 miles in 6 days of 8 hours each; in how many days of 5 hours each could an army of 1,500 men march the same distance?
- If the 6d. loaf weigh 35 oz. when wheat is 37s. a load; what should the 7d. loaf weigh when wheat is 29s. per load?
- If a tradesman use a false weight of $14\frac{3}{4}$ oz. for a pound; how many pounds will 112 lbs. of just weight appear to be when weighed by his false weight?
- Calculate the cost of 365 articles at 13s. $2\frac{1}{2}$ d. each article.
- Find the value of 53 yds. 2 qrs. 3 nails at 5s. $10\frac{1}{2}$ d. per yard.
- Distinguish between simple and compound interest. Find the difference between the simple and compound interest of £1,000 for 3 years at 5 per cent. per annum; also find how long £1,000 would be in amounting to £1,215 10s. $1\frac{1}{2}$ d. at the same rate, at compound interest.
- Bought tea at 4s. 8d. per lb. How must I sell it to gain $12\frac{1}{2}$ per cent.
- A bankrupt owes his creditors £2,960 and can pay them 12s. 6d. per £1. How much would a person receive to whom he owes £641 18s. 4d.?
- Show that 52 weekly payments (made at the end of each week) of £1 5s. each are equivalent to a single payment of £66 5s. 6d. at the end of the 52 weeks; interest at 4 per cent. per annum.
- Explain the difference between banker's discount and true discount. Find both the banker's discount and the true discount on a bill of £250 for four months drawn on the 4th May and discounted 27th July. (The 3 days of grace are to be reckoned.)
- What is the smallest number that contains an exact number of sevens, dozens, and scores?
- Whether is the sum of $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$, greater or less than $\frac{2}{3}$ of the sum of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$; and what is the difference?

15. Prove the rule for reducing a compound fraction to a simple one.

Example.—A cask of wine containing 162 gallons is divided among 7 persons, A, B, C, D, E, F, G, in the following manner: A has $\frac{1}{3}$ of the whole, B $\frac{1}{5}$ of what is left, C $\frac{1}{4}$ of the remainder, D $\frac{1}{3}$ of what C leaves, and the other three share the remainder equally among them. Find the number of gallons claimed by each person.

16. Explain the reason of the rule for the division of vulgar fractions, and divide the continual product of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$, by that of $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$.

17. If $15\frac{3}{4}$ grains of silver be worth $2\frac{1}{2}$ d., what is the worth of $\frac{3}{4}$ dwt.?

18. Add together the following decimals .025, .475, 3.01875, 4.0005. Reduce each of them to a vulgar fraction and add them together, and show that the two results coincide.

19. Divide .0635 by .0048, and multiply the result by 1.62.

20. Explain the term "recurring decimal," and give any method or rule you know for reducing such a decimal to the form of a vulgar fraction. Also find the values of .675 of £1, and of .07589285714 of 1 cwt.

21. Express in the decimal notation £15 12s. 6d.; 16s. $4\frac{1}{2}$ d.; $7\frac{3}{4}$ d.; correctly to three places of decimals; and in common notation the following decimals of £1, .89375, .109375, .6802083.

22. Supposing a currency to be established of which the coinage consists of the pound or sovereign as the unit, the florin or $\frac{1}{10}$ th of £1., the cent or $\frac{1}{100}$ th of £1, the mil or $\frac{1}{1000}$ th of £1. State the advantages of such a currency.

23. A cistern has 4 pipes; A will fill it in 24 minutes and B in 40 minutes, C will empty it in 48 minutes and D in 1 hour. They all run together, but B is closed after 16 minutes and D after 20 minutes; what time is required to fill the cistern?

24. If $\frac{1}{4}$ of an ounce of tea be worth $\frac{3}{4}$ of a lb. of sugar, and $\frac{1}{5}$ of a cwt. of sugar worth $\frac{2}{3}$ of a gallon of rum, and $\frac{1}{10}$ of a quart of rum worth 1s. $3\frac{3}{4}$ d. less than a pound of tea; what is the worth of $6\frac{1}{2}$ lbs. of sugar?

25. Bought sugar at 10d. per lb. How must I sell it per lb. so as to gain as much on £100 as $4\frac{1}{2}$ cwt. are sold for?

26. Suppose that in a town containing 10,560 inhabitants, 1 out of 33 dies annually and that there are 5 births for 4 deaths, the number of girls born being to that of boys as 7 : 9. How many boys and girls are born there annually?

27. Bought 63 dozen of sherry for £78 10s., and having retained a certain quantity for private use, I sold the remainder at £1 9s. 6d. per dozen, and thereby cleared £4 16s. 9d. over the reserve. What quantity did I retain?

BOOK-KEEPING BY DOUBLE ENTRY.

THREE HOURS ALLOWED.

1. State in general terms what are the objects sought to be attained by mercantile book-keeping.

2. What is the distinguishing feature or principle of the double entry method, as compared with that of single entry?

3. Does the double entry method necessarily prevent or detect every description of error or mistake in book-keeping?

Note.—The answer to this question is to be accompanied by reasons for it.

4. What are the principal books usually adopted in keeping accounts on the system of double entry?

5. What is the special use of the Journal?

6. What is the special use of the Ledger, and how is it formed?

7. What is a *Real* account intended to exhibit?

8. What is a *Personal* account intended to exhibit?

9. On which side of a Real account should the entry of property *received* be entered?

10. When cash is *paid* or goods (property) are *delivered* to any person, what account is to be debited and what account or accounts credited?

11. Write out the Journal entries in proper technical form of the following transactions:—

Purchased of Dombey and Son 50 Pipes of
Wine for £1,000
And of John Carker 10 Pipes of Wine for 300
Paid in Cash to Dombey and Son 350
Sold to Dombey and Son a Cargo of Staves for 600

12. Post to appropriate Ledger accounts the same transactions.

13. What is a Profit and Loss account intended to exhibit? and on which side thereof are gains and losses respectively entered?

14. What is the distinction between Gross Profit and Net Profit?

15. What is a Trial Balance? and what purpose is it intended to serve.

16. What should a Balance-sheet exhibit?

17. Work out the following supposititious facts and transactions by double entry through the Journal and the Ledger, and draw out—firstly, a Trial Balance; and secondly, a Balance-sheet accompanied by a Profit and Loss Account.

On the 1st of January, 1858, Andrew Freeport began to trade with a capital of £2,000, consisting of—

Cash	£1,000
Bills receivable—	
due 30th of March	£200
„ 28th of January	100
	300
Wine	700

Total £2,000

	£	s.	d.
Jan. 4th. Sold to John Falstaff a Butt of Wine	150	0	0
9th. Sold to William Honeycomb 3 Pipes of Wine	260	0	0
„ Received from William Honeycomb his acceptance due 31st instant	250	0	0
Abatement allowed (off sale of Wine to him	10	0	0
11th. Bought of Dombey and Son 50 Pipes of Wine	1,000	0	0
12th. Paid in Cash to Dombey & Son	350	0	0
14th. Bought of James Thomson a Cargo of Staves	550	0	0
17th. Sold to Dombey and Son the above Cargo of Staves	600	0	0
18th. Accepted James Thomson's draft, payable 7 days after sight, due 28th instant	550	0	0
19th. Sold to Philip Sidney 4 Pipes of Wine	280	0	0
20th. Sold to John Dryden 6 Pipes of Wine	400	0	0
21st. Received of Philip Sidney his acceptance due 28th Feb.	280	0	0
„ Discounted William Honeycomb's acceptance for £250, due the 31st instant; received Cash	242	10	0
Allowed Discount	7	10	0
22nd. Bought of Dombey and Son 20 Pipes of Wine	340	0	0
„ Accepted Dombey and Son's draft, due 25th March	200	0	0
Paid to them, Cash	100	0	0
23rd. Received from John Dryden, Cash on account	220	0	0

24th. Sold to Alexander Pope 2 Pipes of Wine	120	0	0
„ Bought of William Paley 60 Pipes of Wine	1,200	0	0
„ Received Cash, for Bill Receivable on hand, 1st January, due this day	100	0	0
28th. Paid Cash, acceptance in favour of James Thompson, due this day	550	0	0
29th. Received Cash of Alexander Pope	40	0	0
„ Sold to H. Bardolph, 10 Pipes of Wine	450	0	0
30th. Received of H. Bardolph, Cash on account	200	0	0
„ Bought, and paid for the same in Cash, 15 Pipes of Wine ...	600	0	0
„ Paid Cash: Rent of Counting-house	7	0	0
„ Ditto: Clerk's Salary	10	0	0
31st. Interest on Capital accrued to this date: one month at 5 per cent. per annum on £2,000 ...	8	6	8
„ Drew out Cash for private purposes	100	0	0
„ Stock of Wine on hand at this date	2,500	0	0

Note.—Candidates who reply to No. 17 need not reply to No. 9, No. 10, No. 11, nor No. 12; but “SATISFACTORY ANSWERING” in No. 17 will be deemed an indispensable condition of a “HIGH DEGREE OF EXCELLENCE.”

ALGEBRA.

THREE HOURS ALLOWED.

The Candidates are recommended not to attempt any of the questions in the second portion of the paper, marked B, until they have answered as completely as they can those in the first portion, marked A.

A.

1. Illustrate and explain the rule which is expressed by the formula, $-a \times -b = +ab$.

2. What is meant by the *Greatest Common Measure* of two algebraical quantities?

If R be the greatest common measure of two polynomials P and Q , it is also the greatest common measure of $P+Q$ and $P-Q$.

3. Find the Least Common Multiple of $a^3+2a^2b-ab^2-2b^3$ and $a^3-2a^2b-ab^2+2b^3$. Also of a^2-b^2 , $(a+b)^2$, and $a^2+ab-2b^2$.

4. Divide x^5+y^5 by $x+y$; and prove that x^n+y^n is always divisible by $x+y$, if n be an odd number.

5. Extract the cube root of

$$x^6-6x^5+21x^4-44x^3+63x^2-54x+27.$$

6. Reduce the following expressions to their simplest forms:

$$\frac{x^2-3x+2}{x^3-x^2-x-2};$$

$$\frac{1}{x-1} - \frac{x+1}{x^2+x+1} - \frac{x}{x^3-1};$$

$$\frac{1}{x} + \frac{x-5}{x(x+1)} + \frac{x^2+8}{x(x+1)(x+2)}.$$

7. Solve the following equations:

$$\frac{x-a}{x-b} + \frac{x-c}{x-d} = \frac{a}{b} + \frac{c}{d} \quad (\alpha)$$

$$(x-1)(x-2)+(x-2)(x-3)+(x-3)(x-1)=11 \quad (\beta)$$

$$\left. \begin{aligned} x^2+xy+y^2 &= 7 \\ xy-x^2 &= 1 \end{aligned} \right\} \quad (\gamma)$$

8. A ratio of greater inequality is increased by taking from both terms of the ratio any quantity which is less than each of those terms.

What quantity must be taken from each term of the ratio $a:b:a-b$, to increase it to three times its value?

9. There is a number consisting of two digits, and it is such that if the first digit be doubled it exceeds the second by unity, and that the difference of the squares of the digits is equal to the square of half their sum. Find the number.

Is there anything superfluous in this question?

10. When is one quantity said to *vary* as another? Give examples illustrative of your definition.

The space through which a heavy body falls from rest varies as the square of the time of falling; and in one second a body falls through 16.1 feet. Find the time in which a body will fall to the ground from the top of St. Paul's, the height being 404 feet.

B.

11. Reduce to its simplest form the expression :

$$\frac{a^2+bc}{(a-b)(a-c)} + \frac{b^2+ca}{(b-c)(b-a)} + \frac{c^2+ab}{(c-a)(c-b)};$$

and express the fraction $\frac{1}{x(x+1)(x+2)}$ as the sum of three fractions, having for their denominators x , $x+1$, and $x+2$ respectively.

12. Solve the following equations :

$$\begin{aligned} x^4+x^3+x^2+x+1 &= 0 & (\alpha) \\ x^4+2x^3+x^2+2x+1 &= 0 & (\beta) \\ x^3+y^3+x &= 1 & (\gamma) \end{aligned}$$

13. There is a certain whole number, which being increased by the integral part of its square root becomes equal to 15. Find the number.

14. Distinguish between *Arithmetical* and *Symbolical* Algebra. Is the equation $a^m \times a^n = a^{m+n}$ assumed or proved? What is the meaning of the formula $a^0=1$?

15. A quadratic equation cannot have more than two roots.

In the equation $x^2-px-q=0$, if q be a positive quantity, what conclusion can you draw respecting the nature of the roots?

16. If $ax+by \propto z$, and $a'x^2+b'y^2 \propto z^2$, then

$$\frac{x^2}{y} + \frac{y^2}{x} \propto \frac{z^2}{x+y}.$$

17. The square root of a certain number consists of $2p+1$ digits; prove that if $p+1$ of them have been obtained by the ordinary process, the remaining p may be found by division only.

Can you enunciate an analogous proposition for the extraction of the cube root?

18. A man buys pigs, geese, and ducks. If the geese had cost a shilling a-piece less, one pig would have been worth as many geese as each goose is actually worth shillings. A goose is worth as much as four ducks, and twenty ducks are worth five shillings more than half a pig. Find the price of a pig, a goose, and a duck respectively.

19. A and B run a race of a mile. A gives B a start of n yards and beats him by t seconds. In the next race A gives B a start of t' seconds and is beaten by n' yards. In what time can A and B respectively run a mile?

20. If x be any quantity which satisfies the equation

$$x^n+x^{n-1}+x^{n-2}+\dots+x^2+x+1=0,$$

then $x^{n+1}=1$.

GEOMETRY.

THREE HOURS ALLOWED.

SECTION I.

1. Upon the same base and upon the same side of it there cannot be two triangles which have their sides terminated in one extremity of the base equal to one another, and likewise the sides which are terminated in the other extremity. What principle in the practice of carpentry is an illustration of this proposition?

2. If a straight line be divided into two equal, and also into two unequal parts; the squares of the two unequal parts are together double of the square of half the line, and of the square of the line between the points of section.

3. Describe a square that shall be equal to a given rectilineal figure.

4. Two circles cannot touch one another in more than one point, or intersect one another in more than two points.

5. In equal circles the angles which stand upon equal circumferences are equal. Can the same straight line cut off similar segments of concentric circles?

6. Inscribe a circle in a given triangle; and also in a given Rhombus.

7. Describe a regular pentagon about a given circle.

8. The sides about the equal angles of equiangular triangles are proportionals.

9. If four straight lines be proportionals, the rectangle contained by the means is equal to the rectangle contained by the extremes.

10. Draw three straight lines which shall be in harmonic proportion.

11. If a straight line be at right angles to a plane, every plane which passes through it shall be at right angles to the plane.

12. If each of two solid angles be contained by three plane angles which are equal to one another, each to each, the planes in which the equal angles are have the same inclination to each other.

SECTION II.

1. If the opposite sides of a quadrilateral figure be equal to one another, the figure is a parallelogram.

2. Produce a line so that the rectangle of the whole line so produced and the original line shall be equal to a given square.

3. Upon a given straight line describe a triangle that shall be equal to a given rectilineal figure, and have one angle equal to a given rectilineal angle.

4. A $B C$ is an isosceles triangle. In the base $B C$ take any point D , the circle described through A, B, D , is equal to the circle described through A, C, D .

5. Through a given point without a circle draw a straight line which shall divide the circle into two segments—such that the difference of the angles they contain shall be equal to a given angle.

6. Investigate the conditions under which a quadrilateral figure which can be inscribed in a circle can also have a circle inscribed in it.

7. From the centre of the inscribed circle of an equilateral triangle, a circle is described with radius equal to half the side of the triangle. Show that the tangents to this circle from the three angles form a regular hexagon.

8. How would you proceed in order to show by actual superposition that the square of the hypotenuse of a right-angled triangle is equal to the sum of the squares on the sides?

9. If two spheres intersect, their common section is a circle.

10. The orthographic projection of a cube on a plane perpendicular to its diagonal is a regular hexagon.

11. If through a given point within a triangle, lines be drawn from the angles to the opposite sides, and the points of section be joined, the first three lines will be harmonically divided.

12. A person travelling along a straight line of rail, sees the sun's image reflected in a polished sphere. What is the path of the image on the sphere?

MENSURATION.

THREE HOURS ALLOWED.

1. Show how with a ruler and compasses to find the centre of a circle, and to describe a circle through three given points.

2. On an Ordnance Map of 6 inches to a mile the chord of a railway curve measures 4.654 inches, and its height $\frac{1}{2}$ an inch; what is the radius of the curve on the Map, and in reality?

3. If the chord of half the curve mentioned in the former question be 2.35 inches, what distance is lost by making the curve instead of going straight?

4. Two arcs of different circles are of the same length; they subtend angles of 15deg. 39m. 7sec., and 56deg. 9m. 43sec. respectively; the radius of one circle is 7.75 inches: what is the radius of the other?

5. The sides of a triangle are 7, 13, 18 feet; what is the area? What will be the area of a triangle whose sides are respectively double the above?

6. Find the area of a hexagonal field A, B, C, D, E, F , of which the sides reckoned from A are 26, 23, 18, 10, 16, 13, yards respectively, where the diagonal $AC=24$ yards, and the perpendicular from E falls upon the middle point of AC , and $= 8$ yards.

7. What is the solid content of a frustum of a cone, the height of which is 1 foot 3 inches, and the diameters of its ends 2 feet, and 1 foot 8 inches, respectively?

8. Explain the Sliding or Carpenter's Rule.

9. A piece of timber is 12 feet 9 inches long, $\left\{ \begin{array}{l} 1 \text{ foot 6 inches,} \\ 1 \text{ foot 3 inches,} \end{array} \right\}$ broad, and $\left\{ \begin{array}{l} 1 \text{ foot } 4\frac{1}{2} \text{ inches,} \\ 9 \text{ inches,} \end{array} \right\}$ thick at the $\left\{ \begin{array}{l} \text{larger} \\ \text{smaller} \end{array} \right\}$ end; what is its solid content?

10. Define the term *quarter girt*. And what would be the mean quarter girt of the above piece of timber?

11. What will be the cost of building a wall, with a triangular gable on it of 15 feet, the height of the wall being 48 feet, the breadth of it 42 feet 6 inches, and the thickness $5\frac{1}{2}$ bricks, at 36s. per rod, of $272\frac{1}{2}$ square feet?

12. How much plastering will there be in a room 15 feet long, 12 feet broad, and 9 feet 6 inches high, exclusive of skirting and cornice, there being two doors of 6 feet 3 inches by 2 feet 10 inches, and a window of 4 feet by 5 feet 3 inches? And what will be the cost at 5d. per square yard?

13. What will be the cost of the lead for a gutter down the two equal slopes of a roof, the height of which is $17\frac{1}{2}$ feet, and span 24 feet, at 3d. per lb., supposing each yard to contain 18 lbs.?

14. What would be the cost of glazing a triangular sky-light, the base of which is 12 feet 3 inches, and the height 5 feet 9 inches, at 1s. 4d., per square foot?

15. Show how to determine the content of a cask, considered as the middle zone of a sphere; and find the content in gallons when the diameters of the top and bottom are 4 feet 10 inches, and its height 4 feet 6 inches, inside measure.

16. Explain the term *specific gravity*. The sides of two cubes are as 3:4, their specific gravities as 2:3; compare their weights.

17. Two cubical boxes of oak, 5 inches in the side, outside measure, contain mercury and lead respectively; the thickness of the first box is 1 inch; what must be the approximate thickness of the other, in order that both may be of the same weight; the specific gravities of the substances being mercury 13.6, lead 11.325, oak .925.

18. Explain accurately the principles of levelling, with the corrections for curvature and refraction, and the method by which the necessity for the latter is avoided.

19. From the following notes, plan and find the content of a field.

	to $\odot C$	
	3160	
	2438	
B 1125	1050	960 D
Begin	at $\odot A$	Range East.

20. Also the following:—

	to $\odot D$	
	490	
	260	
G 100	188	75 E
	Go to $\odot F$	
	to $\odot G$	
	420	
D 210	148	
	L of $\odot C$	
	to $\odot C$	
	475	
B 160	375	
	144	
Begin	at $\odot A$	120 G
		Range N

TRIGONOMETRY.

THREE HOURS ALLOWED.

1. Define sine, tangent, secant, degrec; and explain the difference between a geographical degree and a trigonometrical degree.

2. Prove that $\sin A = \sin (180^\circ - A)$; $\cos A = -\cos (180^\circ - A)$; find the sine and tangent of 60° .

3. Prove the following equivalents:

$$(1.) \sin(A+B) = \sin A \cos B + \sin B \cos A.$$

$$(2.) 2 \cos A \cos B = \cos(A+B) + \cos(A-B).$$

$$(3.) \tan(45^\circ + A) + \cos(45^\circ + A) = 2 \sec 2A.$$

4. If $\sin B = m \sin(2A+B)$, prove that $\tan(A+B) = \frac{1-m}{1+m} \tan A$.

$$5. \text{ Prove that } 4 \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{239} = 45^\circ.$$

6. Find the values that A admits of in the equation

$$\sin 4A + \cos 4A = \left(\frac{3}{2}\right)^{\frac{1}{2}}.$$

7. If a, b, c are the sides and A, B, C are the angles of a plane triangle, prove that

$$(1.) \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$(2.) \cot A + \cot B + \cot C = \cot A \cot B \cot C + \operatorname{cosec} A \operatorname{cosec} B \operatorname{cosec} C$$

$$(3.) \tan \frac{A}{2} + \tan \frac{B}{2} = \frac{a+b-c}{a+b+c}$$

8. Explain the ambiguous case in the solution of plane triangles.

9. Solve the following triangle:

$$B=39^\circ 15'; C=45^\circ; AB=100; \log \cos 5^\circ 45' = 9.9978093; \log \sin C = 9.8494850, \text{ and } 1483243 = \log 1.407.$$

10. Explain the process of solution with the help of logarithmic tables of a plane triangle when two sides and the included angle are given.

11. Define logarithm; logarithmic base: and state the convenience of taking 10 as the base for tabulated logarithms. What is the Napierian base, and what is its numerical value?

12. On what principle are the tables of differences and proportional parts formed? If $\log 72.754 = 1.8618569$ and $\log 727.53 = 2.8618509$, find the logarithm of .7275392.

13. Define angle of a spherical triangle; and show that the sum of the angles of a spherical triangle is greater than two right angles, and less than six.

14. The sides of a spherical triangle being given, it is required to determine the cosines of the angles.

15. By what means can the formula for plane triangles be deduced from those for spherical triangles?

16. Enunciate Napier's rules for the circular parts of a

right-angled plane triangle; and prove that $\sin a = \sin c \sin A$; $\cos B = \cot c \tan a$.

17. Two angles and a side opposite to one of them are given in an oblique spherical triangle: show how to determine the other parts of the triangle.

18. Explain the method of calculating the angular distance of two given stars by means of the Theodolite.

CONIC SECTIONS.

THREE HOURS ALLOWED.

1. Define the (1) Ellipse, (2) Parabola, and (3) Hyperbola, as they arise from different sections of a cone: and hence show that particular species of (1) are a circle and a point; of (2) are two parallel straight lines and one straight line; of (3) are two intersecting straight lines.

2. Prove that the Latus rectum of a Parabola is four times the distance of the Focus from the Vertex; and that the Subnormal is half the Latus rectum.

3. A tangent is drawn to a Parabola at a point P , and intersects the tangent at the vertex in the point Y , and the diameter through the vertex in the point T ; S is the focus; it is required to prove that SY is perpendicular to PT ; and that $SP = ST$.

4. Show that the Parameter of any diameter of a Parabola is four times the distance of the origin of that diameter from the focus.

5. A Parabola being drawn on a plane, it is required to find its vertex, focus and directrix.

6. Define focus and eccentricity of an Ellipse; and determine the relation between the distance between the foci and the axes of the curve.

7. Prove that a tangent to an Ellipse at a given point cuts the major axis produced in a point whose distance from the centre is independent of the minor axis of the Ellipse.

8. Perpendiculars are drawn from the foci of an Ellipse on a tangent; prove that the distances of the points of intersection from the centre are equal to each other, and to the same major axis.

9. Define conjugate diameters of an Ellipse; and show that the sum of their squares is constant.

10. Draw a tangent to an Ellipse from a point (1) on it, (2) without it, by means of a ruler only.

11. Explain the elliptic compasses, or any other machine for a description of an Ellipse. How is a lathe ordinarily adapted to elliptic turnings?

12. By the method of proportions prove that:—

(1) The locus of the middle points of parallel chords of an Ellipse is a straight line.

(2) The area of the Ellipse $= \pi ab$.

13. Prove that in a Hyperbola the difference of the focal distances is equal to the transverse axis.

14. The tangents at the extremities of a focal chord of a Hyperbola intersect in the directrix.

15. Define the asymptotes of a Hyperbola; and if a straight line is drawn cutting the Hyperbola and its asymptotes; show that the intercepts between the curve and the asymptotes are equal.

16. Prove that the area of the triangle between the asymptotes of a Hyperbola and a tangent at any point is constant.

17. Show by the method of infinitesimals that an Ellipse is cut at right angles by a confocal Hyperbola.

18. A part of a conic curve is traced on a plane; determine to which of the three conic sections it belongs.

19. Two parallel tangents being drawn to an Ellipse, show that the rectangle contained by the parts of them intercepted between any other tangent and the points of contact is constant.

20. How many normals can generally be drawn to a Parabola from a given point? Find the locus of the point from which two, and no more than two, normals can be drawn.

NAVIGATION AND NAUTICAL ASTRONOMY.

THREE HOURS ALLOWED.

One question to be answered in each Section.

(1)

1. Define the following lines of the Terrestrial Sphere, meridians, parallels of latitude, equator, rumb-line; and show that every section of a sphere by a plane is a circle. When does the rumb-line become a circle?

2. What is meant by "Plane sailing"? Is the difference of latitude found correctly from its principles?

3. Prove that the like parts of two parallels of latitude have the same ratio as the cosines of their latitudes.

(2)

1. Prove; Departure \times Sec. middle latitude = Difference of Longitude, and

$$\text{Tan. Course} = \frac{\text{Diff. Long.} \times \text{Cos. Mid. Lat.}}{\text{Diff. Lat.}}$$

2. What are "Meridional Parts"? What is the value of 1 second of latitude on Mercator's Chart in latitude 60 deg.?

3. What are the advantages of "Great circle sailing"? And what are the practical objections to it?

(3)

1. Investigate a method of finding the distance between two places on a great circle.

2. What is meant by the "Variation of the Compass"? And what is "Local deviation"? How are they allowed for on the compass course?

3. What is the distinction between the "Course from A to B" and the "Bearing of B from A"?

(4)

1. State the direction in which the wind turns in a Cyclone in the North Atlantic Ocean:—and the general track of these Cyclones.

2. Give a rule for finding the bearing of the centre of the Cyclone.

3. In a North Atlantic Cyclone progressing to the North-Eastward, state the successive shifts of wind experienced by a ship lying-to on the North side of the storm's track.

(5)

1. Explain the corrections which must be applied to the observed altitude of the Sun to obtain the true altitude. In what order should they be applied?

2. Define the sensible and rational horizons; and prove that the dip of the Sea-horizon varies with the square root of the height of the eye.

3. Investigate the expression for the augmentation of the Moon's semi-diameter.

(6)

1. Explain the method of finding the latitude of a place from the observed meridian altitude of a heavenly body.

2. Explain in a simple manner the principle of the method of finding the longitude by lunar observations. How may a chronometer be rated by Lunars?

3. When will an error in the observed altitude produce the least effect on the time deduced from it: and why?

(7)

1. Explain the principle of the sextant; and its principal adjustments.

2. What is meant by the "index error;" and how is it determined?

3. Make a sketch of the vernier and the adjacent divisions of the scale of a barometer when it reads 30.270 inches.

(8)

1. What is a "sidereal day"?—a "solar day"?—a "mean solar day"?

2. What is the difference between the sidereal time and apparent solar time? When do they agree?

3. Explain the contents of the column headed "Sidereal time" at page 11, for each month in the Nautical Almanack. Why is it sometimes called the "Right ascension of the mean sun?"

(9)

1. Investigate a formula for computing the altitude of the sun for a given Greenwich date.

2. Investigate a method of clearing the Lunar distance from the effects of parallax and refraction. Explain the correction for the spheroidal figure of the earth.

3. Investigate a method of finding the latitude from the altitudes of a celestial object near the meridian. Show how the "Hour-angles" are computed from "the times by chronometer" for the sun or a fixed star.

(10)

1. Investigate the formula for computing the meridional parts.

2. Show that the "meridional parts" corresponding to the latitude of the most eastward or westward point of a circular island are a mean between those of its most northward and southward points.

3. In a circle of a cyclone, at a given distance from its centre, show how to compute the difference between those parts of its circumference in which the winds are respectively easterly and westerly. And show from your formula that there is no easterly wind when the circumference passes through either pole.

PRACTICAL QUESTIONS.

To be answered in order.

1. A ship sails from latitude 50 deg. 21 min. N.; longitude 35 deg. 0 min. W. on the following true courses:—N.W. 25 miles, N.N.W. 33, and S.W. by W. 50, and W.S.W. 29, required her latitude and longitude.

2. On April 21st, 1858, the meridian altitude of Aldebaran = 31 deg. 18 min. 20 sec.: the star south of the Zenith, Index Correction = 0 min. 45 sec., and height of the eye above the sea 18 feet; required the latitude.

3. Required the Sun's amplitude at rising on June 18th, 1858, in latitude 51 deg. 28 min. N.

4. February 10th, 1858, at about 9h. 35m. p.m. mean time, in latitude 36 deg. 50 min. N., longitude by account 137 deg. 15 min. W., when a chronometer shewed 8h. 18m. 34s., the observed altitude of α Leonis was 42 deg. 36 min. 50 sec., index error = 2 min. 25 sec.; height of the eye 17 feet: required the longitude. On January 23rd at noon the chronometer was fast on G.M.T. 1h. 35m. 15s. gaining daily 2.5 seconds.

5. If on November 19th, 1858, the Sun be observed to have equal altitudes in the morning and afternoon at a place in latitude 42 deg. 52 min. S., and longitude 147 deg. 25 min. E., when a chronometer shows 10h. 49m. 23s. and 3h. 36m. 37s., required the error of the chronometer for mean time at the place at noon.

6. By the Nautical Almanac the distances of the Moon's centre from Pollux at 3h. and at 6h. mean Greenwich time, on Sept. 2nd, 1861, are 20 deg. 26 min. 37 sec. and 22 deg. 3 min. 3 sec., required the time when the distance is 21 deg. 30 min. 31 sec.

(*To be continued.*)

SCIENTIFIC CONGRESS AT CARLSRUHE.

The twenty-fourth meeting of the German Naturalists and Physicians is fixed to be held at Carlsruhe from the 16th to the 22nd of September next, under the presidency and direction of Messrs. Eisenlohr, Aulic Councillor and Professor of Physics at the Polytechnic School, and Bolzert, one of the Council of Physicians. It is expected that this meeting will take place under peculiarly favourable circumstances. Nearly all the noted philosophers of Germany have announced their intention of attending; Von Liebig, Bunsen, Argelander, Wöhler, Erman, Dove, Ettingshausen, &c.

SOUTH KENSINGTON MUSEUM.

During the week ending 10th July, 1858, the visitors have been as follows:—On Monday, Tuesday, and Saturday (free days), 3,697; on Monday and Tuesday (free evenings), 4,028. On the three Students' days (admission to the public 6d.), 972; one Students' evening, Wednesday, 106. Total, 8,803.

THE LONDON MECHANICS' INSTITUTION.

The following communication has been received from the Committee of this Institution:—

"The report of Dr. Lyon Playfair on the London Mechanics' Institution, ordered by the House of Commons to be printed (26th of March last), having thus been made public, and an able article thereon having appeared in *The Times*, followed by the notices of other journals, the Committee of Managers, after due consideration and examination of the various statements made, deem it but justice to the Institution and themselves to make a statement of facts to give the public a more entire and just view of the position of the Institution than would otherwise be obtained.

"The committee admit and deeply regret that the financial difficulties of the Institution have prevented it from continuing classes for instruction in many subjects of art and science, of great utility in themselves, but requiring competent and well-paid professors, and that the same cause has prevented the general character of its instruction being kept up to that standard of efficiency which they feel to be of the utmost importance, and and which the advancing spirit of the age imperatively demands. They are, however, fully sensible that, even without money difficulties, the Institution could not be expected to compete with the high standard of University and Collegiate institutions now offered to the public, probably in a large degree through the very influence and example of the London Mechanics' Institution.

"They believe, however, that it may be made a good preparatory school for such higher institutions to those who have not had preparation at other establishments, or for adults, who would not wish to enter a youthful assembly; and that hitherto it has met, and may meet, the wants of artisans, tradesmen, apprentices, clerks, and the numerous class of confidentially employed persons forming the great mass of the young men of London, who, unable to enter upon a thoroughly scholastic curriculum, may at a small expense pursue two or three branches of study, and thus secure at once the improvement of their minds, assistance in their business from the bearings of their study, and that advancement in social position which is almost inseparably connected with mental culture. These are useful occupations of time for evenings which otherwise might be spent in mere pleasure seeking, and cannot fail to mitigate the social evils which are now the objects of so much public attention.

"The committee also consider that while provision is made for such studies as require close and vigorous mental application, it is equally important that the wants of the large class whose daily avocations involve mental care and anxiety should be met by useful studies of a less severe kind—music, elocution, the various branches of drawing, &c. The same remark applies to the selection of lectures. The rule has been to secure four lectures in the departments of science, literature, and music, alternating through the quarter, and the most eminent literary and scientific men have been and are engaged for the lecture-hall.

"The committee can scarcely agree, nor do they think the public will agree with the opinion expressed in Dr. Playfair's report, that the classes of arithmetic, mathematics, book-keeping, chymistry, anatomy, landscape, architectural, and mechanical drawing, and human figure drawing, French, writing, and elocution, being all those

mentioned in the report except the music classes, 'show a proportion of light instruction to solid rarely to be found.' On the contrary, they are of opinion that these classes are eminently solid, and more useful to those for whom they are designed than more difficult subjects, implying greater previous attainments, at the same time admitting as they have done that many useful studies might be added but for the present low income of the Institute and its heavy debt.

"This building debt, being the expenses of fitting up and adapting a private house to the purposes of an Institution, and building a lecture theatre to hold 1,000 persons, was from the very commencement of the Institution £3,700; by the exertions of the committee of management it was reduced in 1842 to £2,350; interest for 3½ years in arrear to 1846 added to the principal made the debt £2,655 10s.; since which time, owing to the heavy rental of £229 per annum, it has accumulated to its present amount of £3,398 18s. It will thus be seen that, so far from the debt having arisen from an annual increase of expenditure over income, it has scarcely increased from the foundation of the Institution to the present time, notwithstanding the annual payment of 4 per cent. interest in addition to the heavy rental. Had the Institution been free from debt at the outset, it follows that even at the end of the first 20 years the sum of £3,200, being the amount paid for interest alone, would have been added to its funds, and have prevented that injurious economy which has been the great cause of its decline, by actually precluding the carrying out of its legitimate objects.

"Among the causes which have led to the decline of this Institution, in common with others, the committee think the following entitled to consideration:—The extensive and continued alterations in the city and its neighbourhood, and the increased occupation of its houses for business only; the position of the Institution, which, although unrivalled as a central and quiet spot, eminently suited for studious pursuits, still lacks the attractions and external advantages of buildings fronting the great public thoroughfares; and, lastly, the competition arising from evening classes at colleges and Government institutions for conveying high class instruction at a small cost.

"Notwithstanding these, the value of the Institution (which the Committee even now believe to be the best of the kind in London) is unmistakably shown by the large number of its members who come from great distances, many even from the outskirts of London, though other Institutions may be at their very door.

"With a declining exchequer, it is not matter for surprise that the number and efficiency of the classes should have been affected, and that the character of the Institution should not make that advance which the intelligence of the people demanded.

"The report, indeed, when stating the fact of the inadequate remuneration afforded by the Institution to its teachers, and of the various gratuitous services rendered, admits that classes cannot be maintained as vehicles of high class instruction unless the professors are properly paid, and a strong opinion is also expressed that that payment cannot be made out of the subscriptions of the members, who are supposed to belong to the industrial classes. No argument against the management can be fairly deduced from such a statement, which only furnishes a confirmation of the opinion entertained by the Committee as to the necessity of seeking extraneous aid, and does not shake their belief that they have secured the most efficient services at their command consistently with the state of the funds they have had to administer.

"The pressure of the great debt has, no doubt, operated to force a severe and ruinous economy into every department; the library, classes and teachers, the building and its repairs within, and the absence of commensurate publicity and educational enterprise without, all show the crushing effects of building outlay when deducted

from members' subscriptions or income. In place of a noble institution of great power, we find, on close examination, grounds for surprise that students and teachers have so long struggled with inefficient support and accommodation.

"It is felt that the just course now to pursue is—first, to insure vigorous management within; secondly, to call for the aid of all who feel an interest in the prosperity of the Institution. The time has arrived when the institution, still resorted to by hundreds of persons, must, if it is to continue, be permanently placed on a sure footing, and if this is done, it will insure enlarged results—results honourable to the individuals and honourable to the city of the parent Mechanics' Institution.

"The committee are not without numerous testimonies to the usefulness of the institution, and if its doors should ever close, they cannot but believe that it has fulfilled its mission, and that the tens of thousands who have been its members show its influence to have been widely spread, and that it has borne no unimportant part in promoting the education of the people. They believe that it now possesses the elements of strength and adaptability to the wants of the age, and that it is only necessary to assist its funds to allow it to develop them; that its downfall would be a great loss to the community, and, in the language of *The Times*, be 'to the immense disgrace of the cause, to the great discouragement of science, and to the injury of the working classes;' that it is as easy with properly remunerated teachers, to have classes in which principles are taught, as those for mere practice, and that this is the element which must be at the base of all useful instruction. There is reason to believe, that with a removal of its debt and its heavy rental, it would be rendered efficient, and at the same time solvent; and the Committee appeal to all friends of education and kindred societies, to assist their exertions to secure the help of the Government to prevent the parent institution of England from closing."*

Home Correspondence.

SMALL PARCELS POST.

SIR,—There are very few persons engaged in business who will have any doubt of the importance and advantage of establishing a "Small Parcels Post," which is recommended in the Report published in the *Journal* of the Society on the 9th of July.

As a bookseller, sending some hundreds of parcels annually through the Post-office, I am practically acquainted with the peculiar advantages which it affords for the delivery of books in remote places in the three kingdoms, and also in the colonies; and on many occasions orders are given for single volumes to be sent in this way which would never be given at all but for this facility. The establishment of the Small Parcels Post will probably increase even the circulation of books, but it will confer a boon on most trades, which, without any just reason, has been hitherto confined to one. In cases where books are expensively bound, new books intended for presents, and others which require much wrappage and care in the transmission, they are often sent in parcels by railway, as in the conveyance by post, owing to the regulations for packing, a new book when posted becomes a second-hand one before it reaches the end of its journey, and bound books suffer still more. The Small Parcels

* As a proof of the vitality still remaining in the Institution, it may be observed that the members sent up by its Local Board of Examiners to compete for the certificates and prizes of the Society of Arts were remarkably successful, and that the proportion of certificates received by them to the members competing, was such as to secure for the Institution one out of the two prizes given by the Society to Local Boards.

Post will allow of parcels being securely packed; they need not, as now, be left open at the ends, and there will be no occasion at the Post-office to "inspect" them, by cutting off the wrapper, which appears to be the rule prescribed in doubtful cases.

But there is an important defect in the Post-office system in carrying parcels, which the public ought to insist upon having corrected. The railway companies are liable to the owner for the value of any parcel whilst it is *in transitu*,—why should not the Post-office be also liable? Although I have had but few books lost in their transmission through the post, I must add that, from whatever cause it is, I have never been able to recover one which had been so lost. There ought to be the opportunity given to the owners of identifying their property, and of recovering it without so much time being wasted, and so much trouble given, in the investigation, which generally ends in disappointment. The number of books constantly "in warehouse" at the Post-office, shows that in the details of business, on which, after all, no little of the good of any institution depends, there is a want of skill, of energy, or of power. I should propose, as a remedy for their safe transmission, a uniform rate of insurance on all parcels of one halfpenny or one penny up to a certain amount, the owner to have the right of recovery on proof of ownership and value; beyond this fixed value a per-centage insurance sufficient to cover risk; an insurance stamp to be affixed in all cases, before or on delivery to the Post-office agents. At present the Post-office is not liable for any loss. It is high time, however, to explode the popular notion that a registered letter containing property is *insured* by paying sixpence in exchange for the receipt of the Post-office agent. There is a good deal of red tape still in use at the General Post-office.

I am, &c.,

JOHN PETHERAM.

London, July 12, 1858.

SIR,—Highly appreciating the labours of the committee on the Small Parcels Post, I feel it important that every ray of information on this subject, and every suggestion occurring to individuals, should be furnished to the committee.

The advantage of such a means of conveying small parcels would be very great to me, if anything like security could be obtained for safe transmission, which experience convinces me does not exist in the present postal arrangements, for quite 10 per cent. of the parcels I have sent through the Post-office have been lost; this has induced me to send, where possible, through the small parcels conveyances; in them I have never lost a single parcel, although I have sent many times the number that I have sent through the post.

It is true that the Post-office offers an additional security in its system of registration, but the charge for registering is much too high for general adoption, as the cost of carriage must be borne by profits, which upon parcels of average value frequently do not exceed one shilling or one shilling and sixpence, and are very often much less. This I can illustrate in the case of two letters which I lost in June last. One contained a sample of metal of nominal value only, sent as a pattern to A, with an order; this was lost. The other, sent about the same time, contained silver to the value of 35s., sent to an artist, B, for work, for which his charge was 2s. 6d., with instructions to return it in A's parcel. This could not be done, as A, not having received the order, had not any parcel to send; therefore, B sent the silver by post, in which it was lost, he having paid sixpence, making, with the former charge, one shilling for postage, and if these two letters had been registered, that charge would have been doubled, while the whole possible profit arising for the work performed was two shillings and sixpence.

This great obstacle to the transmission of parcels by post I think might be removed by a more moderate

charge for registration, or by an equitable insurance, which is an important consideration, for the usefulness of the Parcels Post will be limited by the amount of the charges, while the success of the scheme must wholly depend upon the extent of its use by the public.

I am, &c.,

E. NASH.

30, Coppice-row, E.C., July 13, 1858.

PARLIAMENTARY REPORTS.

PRINTED SESSIONAL PAPERS.

Parl. No.

Delivered on 6th July, 1858.

- 98 (a4). Poor-rates and Pauperism—Return (A).
- 376. Endowed Schools (Ireland)—Return.
- 261 (1). Colonization, &c. (India)—Map.
- 137. Bills—New Trial in Criminal Cases.
- 169. ——— Titles to Land (Scotland) (Amended).
- 178. ——— Government of India (No. 3) (Amended).
- Ordnance Survey Commission—Report.

Delivered on 7th July, 1858.

- 382. East India (Transport of Troops)—Report from Committee.
- 386. Education (Ireland)—Copies of Report, &c., relating to J. W. Kavanagh, Esq.
- 379. Bills—Universities (Scotland) (as amended in Committee, on Re-commitment, and on consideration of Bill, as Amended).
- 181. ——— Legitimacy Declaration (Amended).

Delivered on 8th July, 1858.

- 363. Billeting System—Report from Committee.
- 375. Coals (Woolwich and Portsmouth)—Return.
- 180. Bill—Sale and Transfer of Land (Ireland) (as amended in Committee and on Re-commitment).
- Discovery of Gold (Frazier's River District)—Correspondence.

Delivered on 9th July, 1858.

- 365. Fire Insurances—Return.
- 399. Mines under the Sea (Cornwall)—Papers.
- 400. Wellington Monument—Copy of Report.
- 388. St. Helena and Hong Kong—Return.
- 182. Bills—Endowed Schools Law Amendment.
- 186. ——— Bishops Trusts Substitution (amended).
- Railways of the United States—Supplement to Capt. Galton's Report.

Delivered on 10th and 12th July, 1858.

- 393. Gas (Metropolis)—Report from Committee.
- 402. Public Income and Expenditure (year ended 30th June, 1858)—Account.
- 162 (7). Civil Services—Estimates (Class 7).
- 347. Ramsgate Harbour—Abstract of Accounts.
- 384. Metropolitan Police—Return.
- 392. East India (Administration of Justice)—Return.
- 389. German Emigration (Cape of Good Hope)—Return.
- 352. Loans (Public Works)—Return.
- 187. Bills—Municipal Franchise (Lords Amendments).
- 192. ——— Railway Cheap Trains.
- 188. ——— Local Government (as amended in Committee and on Re-commitment).
- 189. ——— New Writs.
- 190. ——— Rateable Property (Ireland).
- 191. ——— Gaols and Houses of Correction Act Amendment.
- Netley Hospital—Report of the Site, &c.

Delivered on 13th July, 1858.

- 356. Forgery, &c.—Return.
- 364. Metropolitan Turnpike Trusts—Return.
- 370. Ordnance Survey—Map.
- 406. Bothnia—Return.
- 344. Harbour of Refuge—Report and Evidence.
- 187. Bills—Municipal Franchise (Lords Amendments) (a corrected Copy).
- 193. ——— Chinese Passenger Act (1855) Amendment.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, July 9, 1858.]

Dated 4th March, 1858.

- 430. W. Wilkinson, Bayswater—Imp. in machinery and apparatuses for spinning threads, for preparing threads, for weaving and knitting, for covering cores with fibrous and other materials, and for making ropes, parts of which are applicable as pulleys, reels, and bobbins.

Dated 10th April, 1858.

- 776. J. Oxley, Beverley, Yorkshire—Certain imp. in the doors and sashes of carriages.

Dated 15th June, 1858.

1350. B. Pitt, 4, Great Carter-lane, Doctors'-commons—Imp. in the construction of knobs and roses used with locks, latches, and such like fastenings as are constructed with spindles.
1352. Baron F. Julius, Wedel-Jarlsberg, Frederikswærn, Norway—An improved self-registering compass or control compass.
1354. Sir F. C. Knowles, Bart., Lovell-hill, Berkshire—Imp. in the fabrication or manufacture of steel.
1356. A. Dembinsky, Islington, and A. C. Engert, City-road—An improved fire-proof composition or wash.

Dated 16th June, 1858.

1358. B. Predavalle, 470, New Oxford-street, Bloomsbury—Imp. in the mode of obtaining motive power.
1362. W. Sawney, Beverley—Imp. in apparatus applicable to screening, winnowing, and corn-dressing machines.
1364. J. H. Dickson, Stanley-terrace, Rotherhithe—Imp. in machinery or apparatus for scutching and hackling flax, hemp, and other similar fibrous materials.
1366. J. Westwood, London-yard, Isle of Dogs, Poplar—Imp. in the construction of iron ships.
1368. T. Steven, Glasgow—Imp. in making moulds for casting.

Dated 17th June, 1858.

1370. F. Walton, Wolverhampton—A new or improved manufacture of japanned wares.
1372. J. Allardice, Glasgow, and W. Miller, Blantyre, Lanark, N.B.—Imp. in gasaliers.
1374. G. Hale, Tavistock-street, Covent-garden—Improved apparatus for obtaining motive power.
1376. C. Crockford, Holywell, Flintshire—Imp. in the treatment of the ores of zinc, and in smelter making.

Dated 18th June, 1858.

1378. J. Shaw, Cheapside, Leicester—Imp. in fire-arms.
1380. W. Spence, 50, Chancery-lane—Imp. in clogs, shoes, or supports for the feet. (A com.)
- Dated 19th June, 1858.*
1382. F. G. Spilsbury, Dresden, Saxony—Making tungstic acid and certain of its salts, and for using the same to decolour acetic acid and its compounds.

1386. R. Winans and T. Winans, Baltimore, U.S.—A new and useful imp. in the form of the hulls of steam vessels.
1388. R. Winans and T. Winans, Baltimore, U.S.—A new and useful imp. in ocean steamers.
1390. R. Haldon, Willenhall, Staffordshire—Certain imp. connected with engines worked by steam or atmospheric power.

Dated 21st June, 1858.

1392. Sir J. C. Anderson, Bart., Fermoyle—Imp. in locomotion, parts of which are applicable for other purposes.
1394. R. A. Brooman, 166, Fleet-street—Imp. in steam cocks. (A com.)
1396. J. Lawder, Lieut. and Brevet Capt. in the Honourable the East India Company's Army—A method of supporting or carrying knapsacks, packs, and other weights on the back.
1398. W. C. Wilkins, Long Acre—Imp. in lamps.
1400. W. E. Newton, 66, Chancery-lane—An improved method of effecting the separation of the fibres of wood for the manufacture of paper therefrom, which is also applicable to the separation of the fibres of flax or other substances, for the manufacture of textile fabrics, and also to the separation of other substances for similar or other purposes. (A com.)
1402. W. E. Newton, 66, Chancery-lane—Imp. in the process and machinery for obtaining from waste and refuse felted fabrics of wool, fur, or other materials, fibres in a suitable condition for being worked into felt and other fabrics. (A com.)
1404. H. Deacon, Widnes Dock, near Warrington, Lancashire—Imp. in purifying alkaline lees.

Dated 22nd June, 1858.

1406. G. Schaub, Birmingham—Imp. in the manufacture of door plates, sign-boards, and other surfaces, having inscriptions, designs, or ornaments thereon, and in the manufacture of detached letters, designs, and ornaments to be affixed to walls and sign-boards, or used for other like purposes.
1408. J. Pym, Trinity-square, Surrey—Imp. in machinery for felling trees.
1410. W. E. Kenworthy, Water-lane, Leeds—Imp. in manufacture of steel.
1412. E. Cockey, H. Cockey, and F. C. Cockey, Frome, Somerset—Imp. in apparatus employed in the manufacture of cheese.

Dated 23rd June, 1858.

1414. S. Barlow, Stakehill, near Middleton, Lancashire—Imp. in machinery or apparatus for bleaching or cleansing textile fabrics or materials.
1416. C. Vero and James Everitt, Atherstone, Warwickshire—Imp. in the manufacture of hats.
1418. W. Clibran and J. Clibran, Manchester—Imp. in apparatus or arrangements for distributing, governing the pressure of, and lighting gas.

1420. Sir J. Paxton, M.P., Rock Hill, Sydeham—Imp. in the manufacture of horticultural buildings or glazed structures for horticultural and other purposes.

1422. W. E. Newton, 66, Chancery-lane—Certain imps. in centrifugal governors for steam engines and other motors. (A com.)

Dated 24th June, 1858.

1423. C. Bordas, 8, Upper Stamford-street, Blackfriars-road—Imp. in the mode or method of producing embroidery.
1424. J. Bates and J. York, Hyde, Chester, and W. Parkin, Sheffield—Imps. in pistons and plungers.
1426. G. Collier, Halifax—Imp. in means or apparatus for the stretching and drying of woven fabrics.
1428. W. E. Newton, 66, Chancery-lane—Improved machinery for manufacturing friction matches. (A com.)

Dated 25th June, 1858.

1432. J. Betts, Strand—Imp. in obtaining surfaces on which to print maps and other designs.
1434. T. Booth, Rahere-street, Goswell-road—Imp. in mounting and fitting wheels and axles to carriages, which imps. are also applicable to pulleys and other parts moving on axes.
1436. J. Maudslay, Lambeth—An imp. in the construction of furnaces for melting iron, steel, and other metals.
1438. J. Taylor, Swanton Novers, Thetford, Norfolk—An imp. in the construction of horse-hoes, applicable also to drills.

Dated 26th June, 1858.

1442. S. Whitehall, Jacquard Works, Huskinson-street, Nottingham—Certain imp. in finishing lace and other fabrics.
1444. J. A. Manning, Inner Temple—An improved mode of intercepting and treating the sewage of London, and town and cities similarly situated.
1446. D. Campbell, Wemyss Castle, Kirkcaldy, Fifeshire—A new grubbing and harrowing land roller.
1448. E. E. D'Heurle, Paris—Imp. in boxes for keeping and measuring coffee, tea, and other substances requiring to be preserved from contact of the air.
1450. C. Erhard, 7, Rue des Navarin, Paris—Imp. in apparatus for boring wells. (A com.)

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

1431. C. W. Cahoon, Maine, U.S.—An improved machine for sowing seed or fertilizing material or other substances broad-cast.—24th June, 1858.
1440. T. Lemon, Duke street, Cardiff—Improving Cartwright's original patent chain harrow.—26th June, 1858.

WEEKLY LIST OF PATENTS SEALED.

- | | |
|---------------------------------|-------------------------------|
| <i>July 9th.</i> | 1086. S. Carpenter. |
| 44. T. Knowles & W. Ogilvie. | <i>July 13th.</i> |
| 45. I. Taylor. | 51. C. Barlow. |
| 54. E. B. Bright. | 52. G. W. Muir. |
| 56. W. Parsons. | 53. R. A. Brooman. |
| 57. C. E. Matson. | 63. J. Stenson. |
| 66. J. Varley. | 64. H. Ingie. |
| 85. W. Waller. | 67. C. Schinz. |
| 97. W. Muir. | 76. E. Hills. |
| 103. W. Conisbee. | 80. R. A. Brooman. |
| 104. P. Robertson. | 82. A. Walker and T. Walker. |
| 114. W. Clark. | 94. C. N. Nixon. |
| 121. A. Sterry. | 113. J. S. Brown. |
| 136. J. Garnett and P. Garnett. | 129. J. Elder. |
| 149. J. W. Midgley. | 202. G. Bertram & W. McNiven. |
| 152. P. Bussi. | 239. W. Prown and C. N. May. |
| 165. R. Weare. | 278. E. D. Johnson. |
| 255. L. Cass. | 577. D. Harris. |
| 660. W. Chadwick. | 844. C. Hawker. |
| 956. R. Johanny. | 960. E. Derogy. |
| 978. L. Talabot. | 1078. R. Hislop, junr. |
| 998. T. Preston. | 1081. A. Wolf. |
| 1059. G. Lowry. | 1149. A. P. Price. |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

- | | |
|------------------------|---|
| <i>July 5th.</i> | <i>July 9th.</i> |
| 1516. J. A. Belay. | 1547. J. H. Nalder. |
| 1518. A. H. A. Durant. | 1552. T. W. G. Treeby. |
| <i>July 6th.</i> | 1561. E. D. Chattaway. |
| 1603. H. S. Boase. | 1562. J. Caldwell and J. B. A. McKinnell. |
| 1612. J. Reilly. | <i>July 10th.</i> |
| 1773. E. Hall. | 1555. C. F. Bielefeld. |
| <i>July 8th.</i> | |
| 1548. J. Wilson. | |

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
4103	June 28.	{ Bowman's double action Travelling Blocks, for facilitating the removal of an under tier of casks	J. Bowman	16, Shaw's Brow, Liverpool.
4104	July 7.	An Improved Washing Machine	J. Cowley	Parks, St. Giles, Oxford.
4105	" 9.	Spade or Shovel	Smith and England	Stourbridge.
4106	" 10.	Improved Cork Bottle Stopper	T. H. Rees and J. D. Sprague	64, Union-street, Southwark.